

REMARKS

Claims 1-9 are all of the claims currently pending in this application.

Applicant notes with appreciation the Examiner's indication that claims 4 and 6-9 would be allowable if rewritten in independent form. However, instead of rewriting these claims in independent form, Applicant respectfully traverses the prior art rejections of claims 1-3 and 5 for the reasons discussed below.

1. Claim 1

The language "--and having a width narrower than that of the belt--" in claim 1 is erroneous (see Fig. 1, for example) and, therefore, this language is deleted. Further, the language "at least in the widthwise direction" has been added to claim 1 to clarify its scope. See, for example, page 9, lines 4-8 of the specification.

2. The rejection over Iwata in view of Gerresheim

The present invention is intended to satisfy requirements (1)-(4) as mentioned below.

The first requirement (1) is that the widthwise outer end of a widest-width belt reinforcing layer is arranged outward from a widthwise outer end of a widest-width belt layer.

The second requirement (2) is that the restraining rubber (40) is arranged outward from the widthwise outer end (34) of the widest-width belt reinforcing layer (32a, 32b) at least in the widthwise direction.

The third requirement (3) is that the restraining rubber (40) has a width of not less than 4 mm.

The fourth requirement (4) is that restraining rubber (40) has a JIS hardness not less than a JIS hardness of a coating rubber for the widest-width belt reinforcing layer (32a, 32b).

In the present invention, by having all of the above requirements (1)-(4), the restraining rubber restrains the coating rubber (37) for the widest-width belt reinforcing layer (32a, 32b) surrounding the outermost reinforcing elements (33a) to control the deformation of the coating rubber (37) in the widthwise direction, whereby strain in the coating rubber for the widest-width belt reinforcing layer (32a, 32b) can be decreased to control the separation failure.

Iwata (U.S. Patent No. 4,702,293) discloses a tire in which the second belt layer, having cords arranged substantially parallel to the equatorial plane, extends laterally beyond both sides of the first belt layer between the first belt layer and the carcass.

However, the tire disclosed in Iwata does not satisfy at least requirements (2) and (3) among the requirements (1)-(4) of the present invention, which are mentioned above.

Specifically, as to requirement (2), both side portions of the second belt layer are disposed on top of cushion rubbers, but the cushion rubbers are not disposed outward from (just beside) the widthwise outer end of the widest-width belt reinforcing layer in the widthwise direction.

Requirement (3) which limits the width of the restraining rubber to not less than 4 mm is not disclosed anywhere in Iwata.

Therefore, the tire of Iwata does not satisfy at least requirements (2) and (3), which are needed to obtain the above-stated effects of the present invention.

Gerresheim (U.S. Patent No. 5,879,483) discloses a tire in which the belt reinforcement is arranged on an outside of the belt in the radial direction rather than being arranged on an inside of the belt as in the tire of the present invention.

Although the Examiner states that Gerresheim discloses a range of hardness values (65-75 Shore A) of the cushion rubber, and that belt coating rubbers conventionally have a hardness of 50-60 Shore A, the Examiner provides no foundation for this assertion. In fact, in the conventional tires 1 and 2, as well as the tires of Examples 1-3 and 6-19 disclosed on page 15, lines 10-13 of the specification, the JIS hardness of the coating rubber for the belt reinforcing layer is 70 degrees, which is outside of the range of 50-60, and greater than the lower end of the range of hardness values for Gerresheim's cushion rubber.

The tire disclosed in Gerresheim also does not satisfy at least requirements (1) and (2) among the above-mentioned requirements (1)-(4) of the present invention.

Even if Iwata's tire could have been combined with the cushion rubber of Gerresheim, the construction of the tire recited in claims 1 and 2 of the present invention would not have been achieved, particularly, requirement (2) would not have been satisfied, such that the combination would not have the above-stated effects of the present invention.

3. The rejection over Cluzel in view of Gerresheim

Cluzel (U.S. Patent No. 5,996,662) discloses a tire in which the belt reinforcement is arranged on an inside of belt in the radial direction, the widthwise outer end of the widest-width belt reinforcing layer is arranged outward from the widthwise outer end of the widest-width belt layer and the restraining rubber (rubber cushion 5) is arranged from the widthwise outer end of the inner belt layer beyond the widthwise outer end of the widest-width belt reinforcing layer.

However, the tire of Cluzel requires not only the rubber cushion 5, but also the layer of rubber mix 4 and the wedge of rubber 6.

The basic construction of the tire in Cluzel, as mentioned in column 2, lines 49-63 of Cluzel, consists in combining the widths of the belt reinforcing layer and the belt layers with an arrangement optimized with respect to quality and location of the layers 4, 5, 6 (and 7) of rubber between the different layers.

Furthermore, in the tire of Cluzel, due to the blocking under transverse stress of the complex formed by the belt reinforcing layer 20, the layer of the rubber mix 4 and inner belt layer, the resistance to separation between the edges of the belt layers is improved (see column 2, lines 55-59 in Cluzel).

On the other hand, the tire of the present invention has (1) a construction in which the reinforcing layer, which has a width wider than that of the belt layer, is positioned on the inside of the belt layer in order to restrain the separation between the belt layers, and (2) a construction in which the restraining rubber is positioned outward from the end of the belt reinforcing layer in the widthwise direction in order to restrain the separation generated at the widthwise outer end of the widest-width belt reinforcing layer.

That is, in the tire of the present invention, the problem of the separation between the belt layers is solved by arranging the belt reinforcing layer and in order to restrain the separation generated at the end of the widest-width belt reinforcing layer, the restraining rubber is provided at a proper position, all of this without the need for the layer of the rubber mix 4 and the wedge of rubber 6 as in Cluzel.

Furthermore, Cluzel is silent regarding the hardness and the width (i.e., not less than 4 mm) of the restraining rubber.

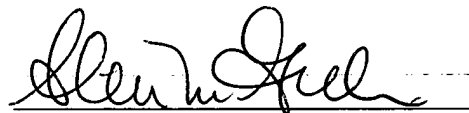
Moreover, although the Examiner states that the hardness and modulus are known to be positively associated (i.e., high modulus, high hardness), this statement is simply not correct.

Rubber that has a high modulus does not necessarily also have a high hardness. For example, it is possible to make rubber that has both a high hardness and a low modulus, and to make rubber having both a low hardness and a high modulus, such as by changing the composition of the rubber. If necessary, data could be submitted showing rubber which has an inversely proportional relationship between the modulus and the hardness.

In view of the preceding amendments and remarks, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue that the Examiner feels may be best resolved through a personal or telephone interview, he is kindly requested to contact the undersigned attorney at the local telephone number listed below.

The USPTO is directed and authorized to charge all required fees (except the Issue Fee and/or the Publication Fee) to our Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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APPENDIX
VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

The claims are amended as follows:

1. (Amended) A pneumatic tire comprising a carcass toroidally extending between a pair of bead portions, a belt arranged on an outside of the carcass in a radial direction and comprised of at least two belt layers containing many reinforcing cords inclined with respect to an equatorial plane of the tire, the cords of which layers being crossed with each other, a belt reinforcement arranged on an inside of the belt in the radial direction [and having a width narrower than that of the belt] and comprised of at least one belt reinforcing layer embedded with reinforcing elements extending in a circumferential direction, and a tread rubber arranged on outside of the belt and the belt reinforcement in the radial direction, in which a widthwise outer end of a widest-width belt reinforcing layer is arranged outward from a widthwise outer end of a widest-width belt layer among the belt layers, and a restraining rubber having a width of not less than 4 mm and a JIS hardness not less than a JIS hardness of a coating rubber for the widest-width belt reinforcing layer is arranged outward from the widthwise outer end of the widest-width belt reinforcing layer at least in the widthwise direction.